Laboratory 6
Using the UART, SPI, and an LCD Display

Due Date: _____   Name**:**_____

Points: 100 Points
Work individually.

Objective: The purpose of this laboratory is to develop your understanding of using the SPI interface on the PIC32MX microcontroller to control the pmod module with the Serial LCD display. In this lab, you will apply what you have done on previous labs using digital communication using the UART. You will be using c function libraries that are included using the *#include <plib.h>* command in your c source file. The c library reference manuals are posted on UNM Learn. SPI sample codes are also posted on Learn.

Activities: For this assignment, you will write a **main** routine which accepts input characters through UART2 from an external terminal, which is implemented using the TeraTerm program. Your main program will then transmit only printable characters to the LCD screen for display.

Part I - Once 16 characters are displayed, your main program will configure the LCD display so that the next characters will be displayed on the second line. If while typing characters on the first line, a carriage return is entered, the subsequent characters will be displayed on the second line. Once the second line is full, or another carriage return is input, the display will not change and the original two lines will be displayed.

Part II – after 16 characters have been displayed on the second line, your program will move the characters on the second line up to the first line and commence displaying any new printable characters on the second line. If a carriage return is input from the terminal before you have input 16 printable characters, your main program will move what is currently on the second line to the first line, position the cursor at the beginning of the second line, and accept up to 16 more characters.

Notes: Is it essential that the USB peripheral module (pmod) be connected to the Chipkit board using a UART crossover cable. The LCD display is connected to the Chipkit board using a pmod cable. Verify that the Chipkit board jumpers are configured properly, to ensure that the pmod boards are powered. You can test the wiring and terminal configurations using the sample codes.

Documentation: Your lab activities must be documented following the guidelines that are provided on the course UNM Learn site. You must also demonstrate that your project functions properly to one of our TAs; who will then sign your copy of this assignment sheet.

Reference Information:

- Cerebott MX7 Board Reference Manual
- PIC32MX5XX/6XX/7XX Data Sheet
- PIC32 Peripheral Libraries for MPLAB C32 Compiler
- PmodCLS Serial LCD Display Module Reference Manual
- PIC32 Reference Manual -Section 23 - Serial Peripheral Interface

Suggestion: Keep all of your files on a USB memory device as there is no guarantee that any information you store on lab machines will be preserved. On occasion, the machines must cleaned and reloaded, so any information stored on them will be lost.